

EDITORIAL ARTICLES.

OPERATIONS FOR THE RADICAL CURE OF HERNIA IN HAMBURG.¹

The radical cure of hernia by operation has within the last fifteen years been a question of great interest, and seems to have been steadily gaining ground, for, as statistics multiply, it is shown that the operation, under strict antiseptic precautions, is not very dangerous, and the number of cases increases where many years after the operation the cure is yet permanent.

Strict rules have not yet been formulated as to which cases should be operated on and which left alone, and it has not yet been determined why some cases are successful and others unsuccessful. The reason why is extremely difficult to find out, for it is extremely difficult to decide if the reason for failure lies with the patient's general condition, or in his conduct after the operation, or in the methods employed.

The writer has collected statistics of 387 cases of hernia operated on in Hamburg between 1880 and 1888. In these cases there were 72 deaths, and he tabulates the cases as follows:

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| Hernia operations, without further description, | cured 61, | died, 18. |
| Herniotomy, no mention of radical cure, | " 95, | " 21. |
| Herniotomy combined with radical cure, | " 100, | " 25, |
| Radical operation for non-strangulated hernia, | " 57, | " 2. |
| Herniotomy and resection of intestine, | " 2, | " 6 |

Of these 387 cases, in only 165 could distinct histories of radical operation be found. These cases were as follows: 51 incarcerated and 40 non-incarcerated inguinal herniæ, of the latter three were double; 64

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incarcerated and 10 non-incarcerated femoral herniæ, a total of 165 operations on 162 patients.

Of the 88 patients with inguinal hernia, 79 were males and 9 were females. Of the 74 patients with femoral hernia, 70 were females and 4 males; 95 hernias occurred on the right side of the body and 67 on the left.

The operations were as follows: In 95 cases after tying the neck of the sac as high as possible, the sac was extirpated and the abdominal ring sutured. In only 17 cases the sac was tied and extirpated without closure of the ring (of these 15 were femoral hernias). In 15 cases suture of the ring alone was put down in the history, but probably the sac had been tied and extirpated. In only 3 cases was the inguinal canal slit open. In 11 cases there was some modification of the above method of operation, but no description given, and in 24 cases the method of operation was not described, only a note of radical operation being put in the history.

In 53 cases the omentum was tied with cat-gut, cut off, and the stump returned to the abdominal cavity.

The hernial sac was generally completely removed after the neck had been tied as high as possible with a cat-gut ligature; only in cases of congenital inguinal hernia, where the elements of the cord were spread over the sac and could not be dissected away, was a partial extirpation done. The testicle and spermatic cord were always carefully preserved. In only one case was the vas deferens cut and it was immediately sewn up again.

As a rule the ring was sewn up, and in the 74 femoral herniæ in only 11 cases it was not attempted, while only twice in the inguinal herniæ, or not sutured 7 times in 165 cases. Catgut and silk had always been used as suture material for this purpose till the spring of 1887, when Schede substituted silver wire, twisting it in place. This wire at first was removed during the process of cicatrization, but later on it was left imbedded in the wound.

Drainage was used as little as possible, and after a time was almost completely abandoned, the tissues being so brought together by No. 1 catgut that no hole or dead cavity remained. The skin wound w

closed by a continuous suture of No. 1 catgut. The healing of the wound occurred without any reaction in 41% of the incarcerated herniæ, and in 35% of the non-incarcerated cases. In all other cases it was disturbed in some way, either by retention of secretions (13 cases), suppuration of the suture track (10 cases), sloughing of the tissues (16 cases), eczema due to bichloride (4 cases), transient swelling of the scrotum (6 cases), infiltration along the spermatic cord (1 case), inflammation of the omental stump (2 cases), delirium tremens (2 cases), extravasation of blood in scrotum (1 case), and in 2 cases it was necessary to remove the wire sutures.

Serious complications occurred only 7 times and were as follows: Followed by cure, 3 cases; once phlegmonic inflammation of the wound, twice phlegmon of the abdominal wall. Followed by death, 4 cases; phlegmon of abdominal wall, 1 case; peritonitis following the operation, 3 cases.

The main point in the treatment of the wound after a radical operation is to obtain a complete primary union, not only of the skin, but of the wounded surfaces made by extirpation of the sac, together with a closure of the hernial exit. By abandoning drainage in these cases, the healing of the wound was much simplified and shortened. The danger of septic infection is not very great, as it only occurred 7 times in 165 cases, or a percentage of 4.24.

Sepsis is more frequent after inguinal than femoral herniotomies, and is easily explained by the more complicated nature of the former wound. The time before complete healing of the wound took place was only stated in 85 cases, and the average time of healing of 10 incarcerated hernias was 20 days. Socin, in 1881, places it at 21 days; in non-incarcerated cases, 21 days. Tilanus, in 1869, places it at 30 days; Socin 31, and Leissink 21 days; Anderegg, in 1886, found that in 136 radical operations done at Socin's clinic, the average time for complete healing, when no disturbances occurred, varied between 14 and 16 days, but where there were complications occasioned by casting off the ligatures, the time was 35 days.

Mortality.—In his mortality statistics Dr. Wolter separates the cases into those where death directly followed the operation from those

in which it was entirely independent but occurred either as a result of the strangulation or of an intercurrent disease. Further, he separates the simple from the strangulated, and the inguinal from the femoral.

Of the strangulated inguinal herniæ treated by operation 7 died; of these, 3 from infection starting in the wound and traveling to the peritoneum; one died of shock, a man, æt. 69 years, with an enormous scrotal hernia of year's standing, which contained the cæcum, all of the colon, and a coil of small intestine. Dr. Schede is of the opinion that the radical operation should not be done in such cases, but that the constriction alone should be relieved, and that the attempt at radical operation in this case was the cause of death. The three (3) other deaths cannot be attributed to the operation, for in 2 death occurred once on the 10th day, and once in the 8th week after complete cicatrization. They occurred in a man, æt. 61 years, and a woman, æt. 80 years, and was due in each case to exhaustion following a prolonged period of rest in bed.

In the third case, a man, æt. 44 years, died 3 days after the operation from intoxication due to retention of fæces, caused by intestinal paralysis. If these three deaths be left out, we have a mortality of 4 in 51 herniotomies, or a death-rate of 7.8%.

According to Leissink's statistics (1883) the mortality following 103 operations for incarcerated hernia was $6\frac{4}{5}\%$ as a direct result of the operation, 4% as a result of the strangulation, and 4% from other causes. In the 64 radical operations for strangulated femoral hernia reported by Wolter, 4 patients died; 2 old women æt. respectively 68 and 69 years, from exhaustion; one woman, æt. 68 years, died on the ninth day after operation from pneumonia and bronchitis; and one man, æt. 61 years, 19 days after complete cicatrization from hæmorrhage due to cancer of the stomach, so that none of these deaths can be attributed to the operation.

According to Leissink, in the 77 cases operated on at Socin's clinic for strangulated hernia, $5\frac{1}{5}\%$ died of sepsis or other sequelæ of the operation, $9\frac{1}{3}\%$ died as a result of the strangulation, and 8% from other causes.

Of special interest are the causes of death after the radical operation for non-strangulated herniæ, as here the patients are supposed to be otherwise healthy. There were 40 radical operations on 3 patients for non-strangulated inguinal hernia done at Schede's clinic; of these 37 patients 2 died; 1, a laborer, æt 52 years, 23 days after the operation died of heart failure; post-mortem examination showed fatty heart, and the local condition was found perfectly normal, except for slight circumscribed gangrene of the omentum with encapsulated suppuration of omental stump. The second case, a sailor, æt. 35 years, suffering from a hernia of 16 years' standing, which for a year had enlarged very much and become irreducible. The patient complained of pain and vomiting for 24 hours. The hernia was irreducible at the operation; only adherent omentum being found in the sac. On the morning of the operation the temperature was 38°C.; on the evening after the operation it was still at the same height; on the following day marked icterus and continual vomiting with no fæcal odor set in. The patient died on the 8th day from suppurative peritonitis and fatty liver; no signs of incarceration of the intestine found at the autopsy. Most probably the patient was already suffering from peritonitis when he was operated on, so the death cannot be attributed to the operation.

Of the 10 operations for non-strangulated femoral hernia all terminated happily. Of the 50 cases of non-strangulated hernia treated by radical operation there was one death, or a mortality of 2%. Tilanus (in 1879) in 79 cases placed it at 11%; Leisrink (1883), 194 cases, 10.8%, of which 7.2% as a result of the operation, and 3.6% from intercurrent disease; Anderegg-Socin (1886), 56 cases, 3.6%; Svensson and Erdmann (Stockholm, 1887), 116 cases, no deaths.

Result.—The primary result of the operation as the patients were discharged from the hospital was such that, with the exception of three cases, by abdominal pressure and coughing, there was no descent of the intestine or bulging at the site of the operation. The exceptions were as follows: In two cases, immediately after the operation, a protrusion of about the size of a walnut returned; and in the third case a complete reposition of the intestine could not be accomplished. All patients were given a light truss on leaving the hospital.

Definite results of the operation for this it is to be determined at what time after operation a cure can be called permanent. Anderegg observed that in 105 cases, 75% of the recurrences took place within the first year after the operation. Banks states that at the end of a year a prognosis as to the definite result of the operation can be given. In the 15 cases of recurrence observed by the writer, in only 11 could the date of the return be settled, and in 10 of them it took place within the first year. According to the opinion of several writers, patients who, at the end of a year after the operation, suffer from no return, may, with great probability, be considered as cured.

Therefore of the 43 cases examined by the writer and found cured, 41 can be tabulated as follows:

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| Free from return at end of 2 years, | - | - | - | 22. |
| Free from return at end of 3 years, | - | - | - | 12. |
| Free from return at end of 4 years, | - | - | - | 2. |
| Free from return at end of 5 years, | - | - | - | 2. |
| Free from return at end of 8 years, | - | - | - | 1. |
| Free from return at end of 10 years, | - | - | - | 2. |

Two cases were found free from return, but two years had not yet elapsed.

In the 58 cases re-examined, in 15 either an incomplete cure or a marked return was found, giving the percentage of recurrence of 25.9. Andrechen, of Zurich, in 1881, examined 39 cases and found 50% of return. Leisrink (1883) found after non-strangulated hernia 20 ¹/₉% of recurrences, while in strangulated cases only 8 ¹/₆%. Anderegg and Socin in 1888 examined 100 cases and found recurrence in 39%. Soenson and Erdmann, of Stockholm, in 1887 examined 48 cases and found 21% of return.

The question is, in how much is the patient benefited by the operation when the result is imperfect, or when a return takes place? The question, according to the observers above mentioned, is answered in the following way: The recurrent hernia is generally small and easily kept in place by a light truss, and causes no marked disturbances. Dr. Wolter found in this respect his experience to agree with that of the other observers.

One of the most important conditions for success after the operation lies in the method employed. Numerous methods have been proposed and abandoned, but since the introduction of antiseptics, a new era has been inaugurated. Up to that time it had been thought the chief aim of the operation was to set up, at the hernial opening, a chronic inflammatory process, with the hope that the opening would be converted into or plugged by a thick mass of cicatricial tissue. These attempts rested on the false idea that the thicker the cicatrix the better the closure. But cicatricial tissue atrophies easily and presents very little resistance. Directly opposed to the old methods are the new ones which aim to cause as little cicatricial tissue as possible, and to close the canal in all its parts in the simplest way possible, so that the natural condition of things will be restored. With this view in mind it has been proposed to tie off or sew up the neck of the sac as high as possible, to extirpate the sac, suture the pillars of the ring, and even slit up the inguinal canal. All the new operations simply differ from one another in that more or less stress is put on one of the above mentioned points.

The abdominal ring was first freshened up and successfully closed by suture by Gross, in 1858; after that it was abandoned, and the idea was again taken up by Steele in 1874, he using catgut instead of silver wire. Dowell and Wood sutured the ring subcutaneously by means of silver wire. Czerny opposed this subcutaneous suture on the ground of its uncertainty, and proposed, together with the ligature of the neck of the sac and removal of the rest, the closure of the hernial opening by means of the pure string suture, and laid much stress on the material employed, stating that the closure was more permanent when silk was used instead of catgut.

In 1884 silver wire was again brought into use, and was employed by Banks; the wire used by this surgeon was of such thickness that it could be easily knotted together, instead of twisted, and since 1887, Schede has employed wire for suture of the ring, allowing this wire to remain in place, being of the opinion that while it remains in place it keeps the pillars approximated and gives a firmer support to the cicatrix.

Lucas Championnière stated that suture of the ring played no part in giving a permanent result, for healing of the aponeurotic columns could not be obtained, and that in many cases of permanent cure the sutured ring was still of sufficient size to admit the tip of the finger; hence healing together of the pillars could not have taken place, and he ascribes the good result to other causes, such as the extirpation of the sac, and its ligature high up. But according to most other surgeons, where permanent cure has taken place there has been more or less growing together of the aponeurotic columns, and all that is needed is a narrowing of the ring, not its complete closure, and this narrowing is obtained by the suture.

Great weight has been placed on ligating the sac as high as possible, but there is a slight difference of opinion as to whether it should be extirpated, or left alone, after being ligated. Schede is of the opinion of leaving it alone, while Langenbeck always advised its complete extirpation. Brocier, who has paid considerable attention to the treatment of the sac, is of the following opinion:

Its extirpation can, under favorable circumstances, bring about a more rapid closure of the wound, but extirpation is not to be done in very weak patients on account of the dangers of prolonging the operation. Extirpation is indicated when the sac is but slightly adherent, and especially where it is thickened and degenerated; contra-indicated when it is strongly adherent, and where very large herniæ exist. If the sac be very thin, and but slightly altered, or if it be firmly adherent, it does not interfere with the healing per primam. In cases where the sac is strongly adherent, but of doubtful viability, its disintegration by suppuration is to be preferred to the dangers attending its extirpation. In Schede's clinic, extirpation of the sac is the rule, and Schede uses numerous interrupted sutures of No. 1 catgut, going under the bottom of the wound, so that all the parts are brought into perfect apposition, through a continuous superficial suture of the same material. At the same time he does away with irrigation, and only uses sponges soaked in a bichloride solution.

Küster, of Berlin, closes his wound by etage sutures. Riesel has advised slitting up the inguinal canal, removing the sac at its junction

with the peritoneum, and then removing so much from the sides of the inguinal canal that by sutures it can be tightly closed around the spermatic cord. Leissink endorses this method, and states that unless this is done the operation is incomplete. Schede condemns this procedure as not only useless but dangerous, and contents himself, like most surgeons, with ligating the sac as high as possible.

Special attention has been given to the point if a light truss should be worn after the radical operation. Anderegg, in 1886, as a result of his experience at Socin's clinic, was of the opinion that so long as no recurrence took place the wearing of a truss should not be allowed, for by pressure of the cushion a depression was produced, which, after the removal of the truss, was converted into an elevation, and the peritoneum became loosened around its margins, predisposing to a return of the trouble. Socin, Beck, Banks and Riesel report a number of cases of permanent cure where patients left off wearing a truss immediately after the operation, and have remained perfectly well, notwithstanding heavy work. On the other hand, many competent surgeons, Schede in 1877, Tilanus 1879, Maas 1879, Lucas Championnière 1885, König 1885, are all of the opinion that a light truss should be worn for some time after the operation. At Schede's clinic it is the rule to advise the patients to wear a light truss for the first few months following the operation, and then to gradually abandon it.

Of the 58 patients examined by Wolter a long time after the operation, among the 43 cured, 27 had regularly worn a truss, 6 only when doing heavy work, 2 had abandoned it immediately on leaving the hospital, and 9 at some time varying from 5 weeks to 2 years after the operation.

Of the 15 recurrences, 6 wore a truss continuously since the operation, 1 wore it irregularly, 3 abandoned it immediately after leaving the clinic, and in 5 no definite data could be obtained.

Dr. Wolter is of the opinion that the permanent cure is in no way affected by the wearing of a truss, and at no time was he able to find any pressure atrophy or any loosening of the peritoneum, and he deems it advisable that the patients should wear a light truss for some months after the operation. Since 1877 Schede has changed his views

on the subject, and claims that pressure of the cushion does in some cases cause atrophy of the scar and now deprecates the use of a truss immediately after the operation, but says all cases must not be judged alike. Where silver wire has been used and left in place he advises no truss; also where the wound has healed throughout per primam, also where the contents of the hernia was only omentum, which was removed.

The tendency to recurrence is much greater when the contents are coils of intestine.

According to Anderegg and the writer, return is more frequent in inguinal than in femoral hernia. In the 22 cases of femoral hernia examined, there were 4 returns, or 18.2%. In the 36 cases of inguinal hernia examined, there were 11 returns, or 30.6%.

The operation of radical cure can be undertaken at any age with the prospects of good results, but the prognosis for permanent cure seems to be specially good when the operation is done in childhood.

The subsequent occupation of the patient as regards heavy bodily exertion seems to have no influence on the return of the trouble. Nussbaum and Anderegg advise a series of gymnastic exercises, after the operation, destined to strengthen the abdominal muscles. Certain constitutional conditions, such as a strumous diathesis, flabby condition of the muscles, and emaciation, greatly interferes with the prospects of good results.

Indications for the Radical Operation.—In all cases of strangulated hernia, where the condition of the intestine permits of its return to the abdominal cavity, the radical operation should be attempted.

The radical operation should not be attempted in early life when, by proper treatment by means of a truss, a cure can be expected. In childhood when, after a prolonged treatment by a truss no result is obtained, a radical operation is to be advised, for this is the time when the best and most permanent results are obtained. According to Rothmund, only up to the 7th year is a cure to be expected by the bloodless method, and from that time on the chances for success diminish.

Reducible herniæ, occurring in youth and adult life, but which are

easily held in place by a truss, and cause no discomfort, ought to be treated conservatively, unless such patients desire a quick and permanent cure.

Irreducible herniæ, as well as those which can not be held in place by a truss, and in fact all those which cause serious discomfort to the patient, present sufficient indications to warrant an attempt at radical cure.

Contra-indications to the radical operation are those cases of strangulated herniæ in the aged, where, in consequence of strangulation, a prolonged operation would be dangerous, and the surgeon must be content with relieving the constriction. Very large strangulated herniæ in the aged should not be operated on radically, and the constriction only should be cut. The radical operation is contra-indicated in all cachectic conditions, and in old age, where it is to be supposed that the patient will be confined to bed for a long time.

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